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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,325	04/28/2006	Hiroaki Nakamura	289426US0PCT	4955
22850 7590 11/02/2007 OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER WILSON, BRYAN E	
			ART UNIT 2891	PAPER NUMBER
			NOTIFICATION DATE 11/02/2007	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/577,325

Applicant(s)

NAKAMURA ET AL.

Examiner

Bryan E. Wilson

Art Unit

2891

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 4-28-2006.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iechi '952 in view of Baldo '698 and further in view of Taguchi '977.

- a. Regarding claims 1-2, Iechi discloses an organic thin film transistor capable of emitting light at high luminescence efficiency where the organic semiconductor layer consists of a luminescent organic semiconductor material (see abstract).

Iechi neither discloses an insulating layer nor that the organic semiconductor comprises a heterocyclic compound containing a nitrogen atom at the condensation site between five member rings or between a five member ring and a six member ring included in the transistor.

However, Baldo discloses an insulating layer (135/145/146; see e.g. [0026], abstract and Fig. 1) formed around a gate structure in a similarly configured structure as that of Iechi. The insulating layer is introduced to reduce or eliminate contact between the gate ('grid 140') and the organic semiconductor layer. Therefore it would have been obvious to a person of ordinary skill at the time of the invention to include the insulating layers as taught by Baldo onto the transistor of Iechi in order to reduce or eliminate contact between the gate and the organic semiconductor layer.

Furthermore, Taguchi discloses an organic luminous layer of high brightness and excellent durability enabled to illuminate with high efficiency that contains a compound having a condensed heterocyclic skeleton containing nitrogen at the condensation site between five member rings (see structure "HT-1" on page 4).

Therefore it would have been obvious to a person of ordinary skill at the time of the invention to have included the compound having a condensed heterocyclic skeleton containing nitrogen at the condensation site between five member rings as taught by Taguchi as the semiconductor layer of the device of Iechi as modified by Baldo above in order to provide an organic transistor capable of emitting light at high efficiency.

While the claims call for the heterocyclic compound to be "formed by condensation", the language, term, or phrase "formed by", is directed towards the process of making a condensed ring structure. It is well settled that

"product by process" limitations in claims drawn to structure are directed to the product, per se, no matter how actually made. In re *Hirao*, 190 USPQ 15 at 17 (footnote 3). See also, In re *Brown*, 173 USPQ 685; In re *Luck*, 177 USPQ 523; In re *Fessmann*, 180 USPQ 324; In re *Avery*, 186 USPQ 161; In re *Wethheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); In re *Marosi et al.*, 218 USPQ 289; and particularly In re *Thorpe*, 227 USPQ 964, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or otherwise. The above case law further makes clear that applicant has the burden of showing that the method language necessarily produces a structural difference. As such, the language "formed by condensation" only requires a structure having five member rings each having a nitrogen atom at a common point shared between the two rings, or a structure having a nitrogen atom at a common point shared between a five member ring and a six member ring which does not distinguish the invention from Iechi in view of Baldo and further in view of Taguchi, who teach the structure as claimed.

Therefore it would have been obvious to a person of ordinary skill at the time of the invention to have included the compounds having a condensed heterocyclic skeleton containing nitrogen at the condensation site between

five member rings as taught by Ueda as the semiconductor layer of the device of Iechi as modified by Baldo above in order to provide an organic transistor capable of emitting light at high efficiency.

4. Claims 1 and 3-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iechi '952 in view of Baldo '698 and further in view of Ueda '057.

- a. Regarding claim 1 and 3-8, Iechi discloses an organic thin film transistor capable of emitting light at high luminescence efficiency where the organic semiconductor layer consists of a luminescent organic semiconductor material (see abstract).

Iechi neither discloses an insulating layer nor that the organic semiconductor comprises a heterocyclic compound containing a nitrogen atom at the condensation site between five member rings or between a five member ring and a six member ring included in the transistor.

However, Baldo discloses an insulating layer (135/145/146; see e.g. [0026], abstract and Fig. 1) formed around a gate structure in a similarly configured structure as that of Iechi. The insulating layer is introduced to reduce or eliminate contact between the gate ('grid 140') and the organic semiconductor layer. Therefore it would have been obvious to a person of ordinary skill at the time of the invention to include the insulating layers as taught by Baldo onto the transistor of Iechi in order to reduce or eliminate contact between the gate and the organic semiconductor layer.

Furthermore, Ueda discloses several materials capable of emitting excellent light emission efficiency and high luminance light made of five member rings each having a nitrogen atom commonly shared between the two rings (see e.g. col. 1 line 55 – col. 4 line 61). With respect to claims 1 and 3, Ueda discloses the structure shown as “formula III” (see e.g. col. 2 line 62 - col. 3 line 17). With respect to claims 1 and 4, Ueda discloses the structure shown as “formula IV” (see e.g. col. 3 lines 18-40). With respect to claims 1 and 5, Ueda discloses the structure shown as “formula V” (see col. 3 lines 41-63). With respect to claims 1 and 6, Ueda discloses the structure shown as “formula VIII” (see col. 4 line 40-61). With respect to claims 1 and 7, Ueda discloses the structure shown as “formula VII” (see col. 4 lines 17-39). With respect to claims 1 and 8, Ueda discloses the structure shown as “formula VI” (see e.g. col. 3 line 64 - col. 4 line 17).

While the claims call for the heterocyclic compound to be “formed by condensation”, the language, term, or phrase “formed by”, is directed towards the process of making a condensed ring structure. It is well settled that “product by process” limitations in claims drawn to structure are directed to the product, per se, no matter how actually made. In re *Hirao*, 190 USPQ 15 at 17 (footnote 3). See also, In re *Brown*, 173 USPQ 685; In re *Luck*, 177 USPQ 523; In re *Fessmann*, 180 USPQ 324; In re *Avery*, 186 USPQ 161; In re *Wethheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); In re *Marosi et al.*, 218 USPQ 289; and particularly In re *Thorpe*, 227 USPQ

964, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or otherwise. The above case law further makes clear that applicant has the burden of showing that the method language necessarily produces a structural difference. As such, the language "formed by condensation" only requires a structure having five member rings each having a nitrogen atom at a common point shared between the two rings, or a structure having a nitrogen atom at a common point shared between a five member ring and a six member ring which does not distinguish the invention from Iechi in view of Baldo and further in view of Ueda, who teach the structure as claimed.

Conclusion

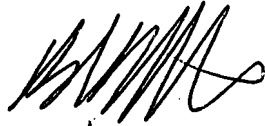
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bryan E. Wilson whose telephone number is (571) 270-1568. The examiner can normally be reached on Monday through Friday 8:00am-4:30pm E.S.T..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on (571)272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2891

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BW
10-25-2007



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